

DIVISION OF ENVIRONMENT
QUALITY MANAGEMENT PLAN

PART III:

BROWNFIELDS PROGRAM
QUALITY ASSURANCE MANAGEMENT PLAN

Revision 2
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Kansas Department of Health and Environment
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TABLE OF CONTENTS

<u>Section</u>	<u>Revision No.</u>	<u>Date</u>
1 INTRODUCTION		
1.1 Purpose of Plan	1	01/08/02
1.2 Plan Revisions	1	01/08/02
2 DESCRIPTION OF PROGRAM		
2.1 Historical Overview	2	03/31/04
2.2 Mission and Goals	2	03/31/04
2.3 Organization and Responsibilities	2	03/31/04
3 QUALITY ASSURANCE POLICY STATEMENT		
4 QUALITY ASSURANCE CRITERIA AND PROCEDURES		
4.1 Field Station Site Selection	1	01/08/02
4.2 Field Equipment Installation	1	01/08/02
4.3 Sampling Types	1	01/08/02
4.4 Safety Consideration	1	01/08/02
4.5 Requesting Analytical Services	1	01/08/02
4.6 Procedures for Assessing Data Precision, Accuracy, Representativeness and Comparability	1	01/08/02
4.6.1 Ongoing Quality Assurance Review and Special Audits	1	01/08/02
4.6.2 Instrument Calibration and Maintenance ..	1	01/08/02
4.6.3 Quality Control Blanks and Spikes	1	01/08/02
4.7 Corrective Action Procedures	1	01/08/02
4.8 Data Management	1	01/08/02
4.9 Quality Assurance/Control Reporting Procedures .	1	01/08/02
APPENDICES	1	01/03/02

Section 1

INTRODUCTION

1.1 Purpose of Plan

This document presents the quality assurance management plan for the Brownfields Program. The plan describes the mission, developmental history, organizational structure, environmental monitoring protocols, data handling procedures, and quality assurance (QA) and quality control (QC) requirements of this program. Standard operating procedures (SOPs) and equipment used in the program are presented in the Appendix A.

1.2 Plan Revisions

To be effective and useable, this document must be maintained in an up-to-date condition. As required by the Division of Environment Quality Management Plan (QMP) (Part I, section 7), the contents of the plan are reviewed on at least an annual basis. Minor changes in the report's organizational structure or terminology may be approved by the Section Chief. However, major revisions which substantially change the contents of the document, especially in terms of QA policies or procedures, require the added approval of the Bureau QA Representative and the Bureau Director.

Section 2

DESCRIPTION OF PLAN

2.1 Historical Overview

The Brownfields Program was initiated through approval of a federal grant from the Environmental Protection Agency (EPA) in 1998. The original grant requested funding to conduct and support brownfields activities in the State of Kansas. The grant provided assistance to KDHE to coordinate cooperative efforts to assess and address brownfields sites to facilitate their sustainable reuse. The Remedial Section is responsible for implementation of the Brownfields Program. The program is designed to perform Brownfields Targeted Assessments (Phase I and II investigations as defined by the American Society of Testing and Materials (ASTM)), assist EPA in the review of contractor produced EPA-lead Brownfields Targeted Assessments (BTA), assist EPA in the review and approval of Quality Assurance Project Plans prepared by EPA's other brownfields grantees in the state, and provide technical assistance to municipalities and the public concerning brownfields issues.

2.2 Mission and Goals

The Brownfields Program follows several guidance documents including EPA 540-R-98-038, "Quality Assurance Guidance for Conducting Brownfields Site Assessments," and ASTM's guidance for conducting Phase I and Phase II Site Assessments. The program is available to qualifying municipalities, other local governments, public entities applying on behalf of their communities, and non-profit organizations who are in the process of purchasing, have purchased, or own property considered for redevelopment activities. Upon approval of an application to the state and approval by EPA, KDHE or KDHE's contractor will conduct a BTA at the subject property. The mission of the program is to determine whether or not contamination exists at the subject property.

2.3 Organization and Responsibilities

ORGANIZATIONAL CHART

(See Exhibit 1 in the BER QA Plan Part II)

The Bureau Director's responsibilities are defined in the BER QA management plan presented in Part II of the QMP.

The Section Chief is responsible for supervising the Unit Chief of the Orphan Sites Unit. The operations and implementation of uniform policies and procedures for the Brownfields Program is the responsibility of the Section Chief. The Section Chief and the Unit Chief, respectively, are responsible for planning, organizing, supervising and directing the statewide activities of the Brownfields Program. Additionally, the Section Chief is responsible for coordination between the units within the Remedial Section.

The Unit Chief acts as the Brownfield Program manager and is responsible to ensure that the requirements of the program-level QA management plans and SOPs are implemented in a consistent, timely and reliable manner. Working with the Section Chief, the Unit Chief strives to improve the precision, accuracy and reliability of all environmental data collected and products (reports) generated as part of Brownfields activities through the effective allocation of staff and resources.

The Unit Chief assigns Brownfields activities to an Environmental Scientist or Geologist who works with an Environmental Technician to complete the task under the supervision of the Section Chief. The Environmental Scientist and/or Environmental Geologist acts as Project Manager for each individual BTA project assigned. All BTAs must have a Quality Assurance Project Plan (QAPP) and Health and Safety Plan submitted to and approved by the Unit Chief, Section Chief, and Bureau QA/QC Representative which meets the objectives and minimum data quality and quantity required of such investigations. All final site assessment reports must be approved by the Section Chief prior to obtaining EPA approval.

At times, KDHE will task the actual investigative work conducted pursuant to the Brownfields program to a private environmental consulting firm working under a time and materials type contract; the contract is developed between BER and the environmental consulting firms. The Unit Leader and the Environmental Scientist and/or Geologist Staff Person actively participate in the contract procurement process.

EPA has requested KDHE to review and approve QAPPs for other EPA grantees in the state of Kansas in lieu of EPA review and approval. When requested, the KDHE Environmental Scientist and/or Geologist will review each QAPP to ensure compliance with KDHE's QMP. Each QAPP must meet the objectives and minimum data quality and quantity required for planned activities. All final QAPP approval must be approved by the Unit Chief prior to providing approval to the EPA grantee.

Section 3

QUALITY ASSURANCE / CONTROL POLICY STATEMENT

Project managers, the Unit Chief, and the Section Chief possess standard operating procedures for administration of quality assurance/quality control for the Brownfields Program. As previously stated, all pertinent EPA guidance consistent with the Brownfield process is adhered to for completion of site assessment activities. Project managers develop site specific Quality Assurance Project Plans, when appropriate, in accordance with KDHE's SOPs and numerous federal regulatory guidance documents for QA/QC. At times, work is performed by an environmental consulting firm working under contract with the KDHE. Each of the environmental consultants working under contract has prepared a well-defined Quality Assurance Project Plan (QAPP) which includes the contractors', and all subcontractors', standard operating procedures for work to be performed, which may consist of SOPs included in Appendix A. These QAPPs and SOPs are reviewed for consistency with KDHE's SOPs during the contract procurement process and prior to formally contracting with the environmental consulting firm.

Project managers and environmental technicians are often responsible for all sampling, including any split, duplicate, or collocated environmental samples to ensure the representativeness and general quality of the various samples collected at a site throughout the investigation. All sampling activities conducted by Brownfield project managers or technicians should follow the following general program guidelines:

- (1) The objectives of any investigation shall be determined prior to implementation of data collection activities.
- (2) Sample collection and analysis activities and data management activities shall be subjected to periodic evaluation by supervisory personnel to identify and, if necessary, to correct deficiencies and enhance the overall quality of the Program.
- (3) All data collection activities will be accomplished and documented in accordance with a Divisional QA plan and applicable Standard Operating Procedures (SOPs), included in Appendix A.

Federal guidance documents frequently referenced for quality assurance/ quality control by Brownfields staff include, but are not limited to:

- C Quality Assurance Guidance for Conducting Brownfields Site Assessments (EPA/540-R-98-038, September 1998);
- C A Compendium of Superfund Field Operations Methods (EPA/540/P-87/001, December 1987);
- C Guidance for Data Usability in Risk Assessment (EPA/540/G-90/008, October 1990);

- C Risk Assessment Guidance for Superfund (EPA/540/1-89/002, December 1989);
- C Standard Operating Safety Guides (EPA Publication 9285.1-03/PB92-963414, June 1992);
- C Standard Practices for Description and Identification of Soils; (American Society for Testing and Materials Standard D-2488, October 1990);
- C Standard Practices for the Design and Installation of Ground Water Monitoring Wells in Aquifers; (American Society for Testing and Materials Standard D-5092, October 1990);
- C Standard Practices for Soil Investigation and Sampling by Auger Borings; (American Society for Testing and Materials Standard D-1452, October 1990);

Section 4

QUALITY ASSURANCE / CONTROL CRITERIA AND PROCEDURES

4.1 Field Station Site Selection

The selection of sampling locations is based on several factors including type and purpose of the sample, representativeness, accessibility (permission to sample), location of existing wells, location of potential source areas of contamination and location of potential target areas. Selection criteria vary depending upon the type of medium being sampled and the purpose of the sampling which are described in site-specific work plans.

4.2 Field Equipment Installation

Generally field staff will use non-dedicated sampling equipment that is either disposable or reusable. Sampling equipment designated for reuse must be decontaminated as specified in SOP (BER-05). Some sites as designated by the project manager may have dedicated sampling equipment in place.

4.3 Sampling Types

Program staff perform a majority of all sampling activities required for completion of BTA projects. Program staff provide quality assurance/quality control through the collection of split, duplicate, replicate, field blanks, trip blanks, etc. based on the type and quantity of environmental sampling necessary for a particular project. BTAs may also be contracted out through a federally procured contractor. The contractor follows KDHE's protocol. When KDHE's contractor conducts sampling activities, program staff provide quality assurance/quality control management services through the oversight of work conducted by the contractors.

Soil is the most frequent environmental media sampled, followed by ground water, surface water, sludge, sediment, and air. Potential source wastes containing hazardous substances may also be sampled. The Brownfields program staff utilizes geoprobes, drill rigs and other equipment when possible for the installation, development and sampling of monitoring wells, subsurface soil sampling, direct push sampling, soil gas and ground water screening sampling. All sampling will utilize the proper and appropriate levels of personal protective equipment (PPE) and follow the appropriate guidance, standards or standard operating procedures. Data validation of sampling is performed by the Data Validation Officer for each site under the supervision of the Unit Chief.

Program staff collecting quality assurance/quality control environmental samples adhere to the sample collection procedures specified in the site-specific QAPP. Data validation and review of QA/QC sampling is performed during development of the BTA report.

QA/QC sample collection procedures proposed by KDHE's environmental contractors are reviewed for compliance with their standard QAPP and SOPs as well as KDHE's SOPs. KDHE's approval of the site-specific Field Sampling Plan is dependent upon the sampling plan's compliance with field methods and sampling procedures provided in the "Compendium of Superfund Field Operations

Methods”, which is a compilation of demonstrated field techniques that have been used during remedial response activities at hazardous waste sites (U.S. EPA, September 1987). The purpose of the FSP is to ensure that sampling data collection activities will be comparable to and compatible with data previously collected.

Program staff independently collecting environmental samples follow various internal standard operating procedures. Standardized operating procedures (SOPs) developed for program staff include: BER-01 for the collection of ground water samples from monitoring, public or private wells; BER-03 for the collection of soil samples; BER-02 for the collection of surface water samples; BER-04 for the collection of sediment samples; and BER-11, BER-12, and BER-19 for sample control, i.e. identification, transport and chain-of-custody; BER-07 for sampling soils, water and soil gas with the Geoprobe soil gas rig; BER-06 for drilling and installation of soil borings and monitoring wells; BER-20 for hazardous waste sampling; and BER-05 for decontamination of sampling equipment.

4.4 Safety Considerations

Field and laboratory staff that conduct environmental investigations encounter potentially dangerous situations on a frequent basis. In addition to the routine possibility of automobile or equipment accidents, employees may encounter extremely slippery surfaces, toxic or hazardous substances, infectious microorganisms, fire or electrical hazards, vicious dogs, belligerent persons, or other threatening situations. Injuries or illnesses resulting from such situations are unfortunate from a QA/QC perspective and deprive programs of the services of a valuable employee for an extended period of time.

Although it is not possible to predict every conceivable risk that may arise during the course of work, supervisors must ensure that those risks faced by staff on a recurring basis are addressed in the SOPs and are discussed during employee training. Field and laboratory staff are expected to abide by the safety protocols contained within the QA management plans and SOPs and to integrate safety considerations into all aspects of their work. Field staff should follow SOPs BER-18, and BER-21. BER routinely budgets for ongoing safety training expenses and annual medical physicals for field staff associated with monitoring and/or field inspections of hazardous materials (refer to BER-17).

Non-supervisory employees are expected to bring potentially unsafe practices or situations to the attention of the project or program manager. In turn, the program manager shall evaluate the practice or situation and either take the appropriate corrective action or, in complicated circumstances, seek the advice of the appropriate Section Chief or higher level supervisor. Major corrective actions (i.e., those warranting changes in an SOP) shall be implemented by staff only upon approval of the Section Chief, Bureau QA Representative and Bureau Manager.

4.5 Requesting Analytical Services

Brownfields staff have several options for the submittal of environmental samples to a laboratory for analyses. Staff can submit environmental samples directly to the Kansas Health and

Environmental Laboratory (KHEL) or contract the services of an outside laboratory that meet acceptable internal laboratory QA/QC standards. Samples submitted for laboratory analysis by

KDHE's environmental contractor are submitted to a laboratory that has been previously approved by the SWP project manager during the work plan review and approval process.

The laboratory selected by the KDHE project manager or the environmental consultant must have a specific Quality Assurance and Quality Control Plan approved by the Division Director prior to utilization by the Section. Generally, the KHEL will be used for a majority of the program's analytical service. However, the purpose of the contractual arrangements is to provide additional analytical capacity and a contingency laboratory; quality assurance and quality control (inter-laboratory duplicates); and to provide expanded analytical services. The Brownfields Program also has the capability of running in-field analyses with its mobile gas chromatograph (GC) laboratory housed in the Geoprobe van as well as other screening-type analytical equipment. All appropriate manufacturer's manuals and procedures for data validation are to be followed for all in-field analysis, and an appropriate data validation discussion and analysis will be contained in the report.

4.6 Procedures for Assessing Data Precision, Accuracy, Representativeness and Comparability

4.6.1 Ongoing Quality Assurance Review and Special Audits

QA/QC aspects of the Brownfields Program are subject to ongoing review by the Unit Chief and the Section Chief. Industrial and governmental practices, guidelines and standards are also subject to constant change and upgrading. Staff are expected to cooperate fully with administrative requests for information on data precision/accuracy and overall QC performance. Staff are also expected to incorporate appropriate changes and modifications to the project QAPPs and reports. The Unit Chief is expected to track the QC performance of project managers, assist managers in identifying QC deficiencies within their assigned projects, and facilitate the initiation of necessary corrective actions. The Section Chief is expected to track the overall QC performance of the programs within the Remedial Section, assist in identifying QC deficiencies within the programs, and, if necessary, facilitate necessary corrective actions. The results are reported to the Bureau QA Representative and the Bureau Manager.

To enhance the quality and credibility of the environmental data gathered by program staff, the Brownfields program may, at the discretion of the Section, Chief, Bureau Director, or Deputy Division Director, be required to participate in QA/QC audits performed by an independent party. Audit findings, and corrective actions implemented in response to such findings, are reported to the Bureau QA Representative, Bureau Manager and Deputy Division Director in the annual program QA/QC reports.

4.6.2 Equipment Calibration and Maintenance

For field work conducted independently by Brownfield program staff, all equipment must be checked out from the Bureau's Equipment and Supply Technicians. The individual users of field

equipment are responsible for the maintenance (in accordance with manufacturer's procedural manuals and/or standard operating procedures) of the equipment while being used in field operations. The user should ensure the equipment is checked for proper operation and is current with calibration requirements (if needed) prior to leaving for field. The user should record calibration and any malfunctions encountered while in the field in the logbook associated with the equipment. The user should make sure the malfunctions are communicated to the Section Chief or appropriate supervisor upon return of the equipment to storage so that appropriate action can be initiated to repair the item of equipment, or initiate actions (e.g., prepare a Purchase Request or Purchase Acquisition) to get the equipment repaired upon return from the field. The operation and calibration of the mobile GC unit will strictly follow the manufacturer's instructions and guidance to assure the highest quality of field GC data. Only persons fully trained in the proper use and QA/QC procedures of the field GC will be allowed to operate this unit.

KDHE's environmental contractor's are required by the Brownfield project manager to identify all equipment to be used for Brownfield related activities. Project managers review all proposed equipment to ensure the equipment is appropriate for the intended task and desired data quality objectives. The project manager also reviews proposed calibration procedures and frequencies of field equipment to determine compliance with the environmental contractor's SOPs. The environmental contractors are required to provide post documentation of calibration and results conducted during field activities. SWP environmental contractors are generally required to provide a statement that all equipment is maintained in accordance with manufacturer's direction (usually included with the SOPs provided in the contract procurement process).

4.6.3 Quality Control Blanks and Spikes

Quality control procedures must be taken by field staff to ensure the integrity of the samples collected. Without checks on the sampling and analytical procedures, the potential exists for contradictory or incorrect results. Procedures describing quality control samples are defined in BER-12 or are included in specific SOPs.

4.7 Corrective Action Procedures

Corrective actions may be implemented on environmental samples that do not meet QA specifications as determined by EPA or KDHE guidelines. In general, the corrective action procedures address the analysis of any cause precipitating a negative audit finding and identifies the appropriate corrective action(s) necessary to address it. Brownfield program staff, or appropriate quality assurance/quality control program designee, are responsible for reviewing data validation reports, audit reports and reports of non-compliance with appropriate guidelines and standards, to identify significant or repetitious conditions adverse to quality, or deficiencies regarding the implementation or adherence to required quality assurance practices. In addition, the program staff, or QA/QC designee, is required to investigate the source(s) of the problem and is responsible for defining and/or implementing the necessary actions to remedy the problem.

The quality characteristics of data generated by sampling, monitoring, or analyzing, is defined in the following terms:

Accuracy: The degree of agreement of a measurement, or an average of measurements of the same thing, X , with an accepted reference or true value, T , usually expressed as the difference between the two values, $X - T$, or the differences as a percentage of the reference or true value, $100 (X - T)/T$, and sometimes expressed as a ratio, X/T . Accuracy is a measure of the bias inherent in the system.

Precision: A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is best expressed in terms of the standard deviation. Various measures of precision exist depending on the prescribed similar conditions.

Completeness: A measure of the amount of the valid data obtained from a measurement system, compared with the amount that was expected to be obtained under correct normal conditions, and that was needed to be obtained in meeting the project data quality objectives.

Representativeness: The degree to which data accurately and precisely represent a characteristic of population, the parameter variations at a sampling point, a process condition, or an environmental condition. It also includes how well the sampling point represents the actual parameter variations that are under study.

Comparability: The confidence with which one data set can be compared with another; a qualitative characteristic that must be assured in terms of sampling, analysis, reporting, etc.

The exact values of the quality characteristics will vary depending upon the analytical processes and procedures employed. Site-specific work plans will detail the recommended field activities and analytical methodologies necessary to establish the appropriate data quality characteristics. Corrective actions may include resampling, reanalyzing samples, or auditing laboratory procedures.

4.8 Data Management

All work plans submitted in association with the Brownfield program, as well as sampling plans generated internally, require field logs, sample management and tracking procedures, and document control and inventory procedures for both laboratory data and field measurements to ensure that the data collected during the investigation are of adequate quality and quantity to support the findings of the investigation.

For each measurement, the data reduction scheme planned for collected data, including all equations used to calculate the concentration or value of the measured parameter, should be described. The principal criteria employed to validate the integrity of the data during collection and reporting should be referenced. All data collected should be validated at the appropriate field of laboratory quality control level to ascertain whether it is appropriate for its intended use. All task management and quality controls implemented shall be documented in the appropriate section of the report.

4.9 Quality Assurance/Control Reporting Procedures

All reports or deliverables submitted through the Brownfield Program will summarize quality

assurance/quality control for the project. The appropriate report may contain an assessment of measurement data accuracy, precision and completeness, results of any performance audits, results of system audits, any reported instances of non-compliance with established guidelines, and any quality assurance problems, together with recommended solutions or corrective actions.

In addition, end-of-year program QA evaluations are conducted by the Section Chief and the results submitted, in writing, to the Bureau QA Representative, Bureau Director and the Deputy Division Director by February 15 of the following year. The reports must indicate when, how, and by whom the evaluation was conducted, the specific aspects of the program subjected to review, a summary of important findings, and technical recommendations for necessary corrective actions. The Section Chief is expected to discuss the findings of these evaluations with the Unit Chiefs and all participating field, laboratory and data management staff.